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Journal of the Society of Arts.

FRIDAY, OCTOBER 10, 1856.

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MEETING OF COUNCIL.

Wednesday, Oct. 8, 1856.

At a Meeting of the Council, held this day, Colonel Sykes, F.R.S., Chairman of Council, in the chair, it was resolved—

"That the Society's Examinations for the North of England be held at Huddersfield, during the week commencing June 1st, 1857."

"That a sum of one hundred guineas be awarded by the Society's Examiners in general prizes at the ensuing Examinations of the Society in June next."

Several Trade schools and Commercial schools having applied to the Society to be taken into union, in order that the pupils of such schools may avail themselves of the Society's Examinations, it was resolved—

"That Trade Schools and such other Schools as profess to teach the elements of manufacturing or commercial knowledge be eligible for admission into union on the same terms as Mechanics' Institutions."*

The following Institutions have been taken into Union since the last announcement:—

420. Bridport, Literary and Scientific Institution.
421. Bristol, Diocesan Trade School.

UNION OF COLONIAL INSTITUTIONS.

At the meeting of the Council held on the 8th instant, the following Colonial Institutions were taken into Union, in accordance with the Resolution of Council of the 19th of December, 1855:—

Royal Agricultural Society of British Guiana.
Sydney Mechanics' School of Arts.
Horticultural Improvement Society of New South Wales.
Mechanics' Institution, Hobart Town.

SUBJECTS FOR PREMIUMS.

(Continued from page 733.)

77. For the production of a perfectly Colourless Copal Varnish, not liable to change or contract, or to injure the colours over which it is applied.
78. For an account of the best methods of dissolving Amber, to make colourless amber varnish for artists.
79. For the production of a Colourless Gold Size, not liable to affect the delicate tints with which it is mixed when used to facilitate their drying.
80. For a pure Colourless Oil suitable for Artists, or for a decolorising agent for linseed oil which will leave its other properties unimpaired.
81. For an account of the manufacture of Garancine, as now practised in France, commencing with the best processes for grinding the root to powder; with observations as to the modifications which might be necessary for rendering similar machinery available for grinding Indian Munjeet or Madder.
82. For the production of cheap Purple and Yellow Lakes, of good quality, suitable for carriage-builders, &c., and not liable to fade or change colour.
83. For the importation into this country from India, Australia, Canada, New Zealand, the Cape Colony, the West Indies, and other British Colonies, of new descriptions of Wood, fitted for manufacture, turning, &c., and not hitherto imported.
84. For the discovery and importation of a Wood suited to the purposes of the wood engraver, and of such dimensions as to supersede the necessity of uniting several blocks.
85. For the best samples of Ornamental Woods from Ceylon, New Zealand, or any other British Colony, new to commerce and suitable for the manufacture of furniture.
86. For the importation of the largest quantity of American White Hickory.
87. For the discovery of an economic and effective substitute for the Teazels used in raising the face or nap of cloth.
88. For the best essay on the distribution of Beds of Shells, and sources of supply of Mother-of-Pearl, especially those hitherto undeveloped by commerce.
89. For an account of the origin, development, and present condition of the Pearl Fisheries of Ceylon, the Persian Gulf, and the Gulfs of Mexico and Panama.
90. For an account of the Sponge and Coral Fisheries, and the development of new sources of supply.
91. For the most complete series of Animal Substances, raw and manufactured, illustrating the natural resources of any one of the following British possessions:—The East or West Indies, Ceylon, Australia, Canada, the Cape Colony, and New Zealand. Each collection to be accompanied by a detailed account thereof.
92. For the most complete series of Vegetable Substances, raw and manufactured, illustrating the natural resources of any one of the following British possessions:—The East or West Indies, Ceylon, Australia, Canada, the Cape Colony, and New Zealand. Each collection to be accompanied by a detailed account thereof.
93. For the most complete series of Mineral Substances, raw and manufactured, illustrating the natural resources of any one of the following British possessions:—The East or West Indies, Ceylon, Australia, Canada, the Cape Colony, and New Zealand. Each collection to be accompanied by a detailed account thereof.
94. For a method of preparing an Engine Size for the use of Papermakers, superior to any now in use.
95. For improvements in the apparatus and processes for Evaporating Brine, and obtaining a pure marketable salt.
96. For the best account of the mode in which Size from Sea-weed is prepared and used by the Chinese.

Classes V. to X.—Machinery.

97. For an account of recent improvements in the construction of Steam Engines, whereby increased power is obtained with diminished consumption of fuel.
98. For an account of the machinery and processes employed in the manufacture of Nails.
99. For an account of the machinery and processes employed in the manufacture of Screws.
100. For a cheap Portable Machine for cutting, squaring, and dressing Stone for building purposes.
101. For an account of the uses of Wire Rope, with a review of its relative merits when compared with hemp rope and chains, particularly for drawing in deep shafts.

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* Purely Classical Schools are not eligible for admission.—*Ed. S. A. J.*

102. For an account of the machinery and processes at present employed on the Continent for Earth-Boring.
103. For an account of any recent improvement in Sawing and Shaping Machines.
104. For an Essay on the application of Steam Power to the cultivation of the soil.
105. For an Essay on the principles which should regulate the construction of Reaping Machines, with a review of those which have been practically tested.
106. For an account of the machinery employed in reaping, drawing, threshing, hulling or shelling, grinding, crushing, cutting, and pulping Farm Produce.
107. For the best method of Drying Corn, both before and after being thrashed.
108. For an account of the best machinery employed in drying, cleaning, grinding and dressing Wheat into flour.
109. For an account of the best machinery for preparing, grinding and dressing Barley and Oats into their respective manufactured constituents, pearl Barley, Groats, &c.
110. For a cheap and effective machine for cleaning and hulling Rice, so that it may be prepared and shipped at the seat of production in a marketable condition.
111. For an account of improvements for Consuming or Preventing Smoke in Glass-works and Iron-foundries.
112. For an account of improvements in Consuming or Preventing Smoke in Dye Houses and Chemical Works.
113. For an account of the methods now in use for working Malleable Iron; and of any improvements in the machinery employed for converting iron into bars, plates, &c.
114. For the best essay on Motive Agents, that have been introduced or proposed, and the peculiarities of the machinery for utilizing the power obtained, with the results of experiments.
115. For the best essay on Electro-Magnetic Engines.
116. For the adaptation of a new submerged Propelling Power in Marine Navigation, which shall possess all the advantages of the screw-propeller, and be more directly acted upon by the moving power.
117. For any practically tested improvements in Diving Bells and Diving Apparatus, calculated to facilitate submarine operations, and suited for the sponge, coral, and pearl fisheries.
118. For an account of the mechanical means at present in use to facilitate the operation of Packing Goods, whether by hydraulic presses, or otherwise.
119. For the best form of Street Goods' Waggon; the improvements required are a lower centre of gravity, and a ready means of loading and discharging heavy packages.
120. For an account of improvements in the manufacture and refining of Sugar.
121. For an account of improvements in the manufacture of Sugar from Beet-root, in Great Britain and Ireland, and of the results obtained.
122. For a Meter to be attached to Stills which shall register accurately for Excise purposes, the quantity and strength of spirit coming over in the process of distillation.
123. For an account of improvements in the Construction and laying out of large Breweries, and the Plant connected therewith.
124. For an account of improvements in the Construction and laying out of large Distilleries, and the Plant connected therewith.
125. For an account of the machinery and processes employed in Sugar-refining.
126. For the invention of a complete system of machinery for making Casks, with an account of the machines at present in use.
127. For an account of the improvements in the construction and arrangement of machinery for spinning and doubling Cotton and other fibrous materials.
128. For an account of improvements in the machinery and processes employed in the Manufacture of Woollen Cloths.
129. For a mechanical substitute for hand labour in running in the outline to the figures in machine-wrought lace.
130. For the best mode of finishing the edges of machine-made Bobbin Lace (in imitation of pillow lace), so as to supersede the use of the separate pearl edge, usually sewn on.
131. For improvements in the machinery for weaving Lace, whereby the outline of the pattern produced shall be worked simultaneously with the production of the fabric, without the intervention of hand labour.
132. For an account of improvements in Thrown Silk and Machinery for producing it.
133. For an account of improvements in the Machinery and Processes employed in the Manufacture of Silk and Mixed Fabrics.
134. For a Bobbin for Silk which shall possess exact uniformity of weight, shall be incapable of being made heavier without instant detection, and that shall not absorb damp from the atmosphere. The material employed must not be liable to chip, or to affect the colour of the silk wound on it.
135. For a Machine which may serve as a substitute for hand-labour in cutting the pile of Velvet and similar fabrics.
136. For an account of the machinery and processes other than hand-labour employed in the production of Embroidered Fabrics.
137. For a Machine for Composing Types, which shall obviate the objections to those already introduced.
138. For an account of improvements in the modes of printing, including the manufacture of Types, Stereotyping, and Printers' Plant in general.
139. For an apparatus or means for damping Printing Paper, to supersede the process of wetting by hand.
140. For an Inking Roller for the Printing Press that will not crack at a high temperature.
141. For a self-acting Counting Machine, suitable for telling off quires or reams of paper at the end of a paper machine or printing press.
142. For the best Ruling Machine, combining delicacy of the lines with distinctness, and more economical than any now in use.
143. For a means, suitable for office use, of Writing, Copying, or Producing a single or several Copies of a Document at one time, by electricity or otherwise.
144. For a rapid means of Reproducing Artistic Designs or Sketches, without the intervention of hand labour, for surface printing by machinery.
145. For the best specimen of Copper-plate and Surface Blocks, produced by the action of Light, Electricity, Mechanism, or otherwise.
146. For a rapid means of Reproducing Artistic Designs or Sketches, and also for Reproducing Copper-plate Engravings (from the plate or from the impression) for Surface-printing by Hand-press or Machinery, without the intervention of *Hand-labour*.
147. For an essay on mechanical and other contrivances for Reducing, Enlarging, Copying, and Reproducing Mechanical Drawings, suited to the purposes of the lithographer, &c.
148. For the discovery of any simple and efficient apparatus for detecting and registering impure states of the atmosphere, either in mines or in over-crowded and ill-ventilated buildings.

149. For the invention of a Voltaic Battery of as great intensity as any at present in use, of less cost, and acting without the production of noxious fumes.
150. For the invention of a simple Electrometer, to be sold at a moderate price, for determining the amount and kind of atmospheric electricity; and which will show uniform results under uniform circumstances.
151. For the invention of a Self-registering Electrometer showing the kind as well as the amount of electricity.
152. For a Self-registering maximum or minimum Hygrometer.
153. For the invention of a Marine Mercurial Barometer, which will obviate the oscillation of the mercury, and fulfil all the conditions necessary to make it a good and reliable instrument; to be sold at a moderate price.
154. For the invention of an Anemometer, for measuring the force and direction of the wind on board ship correctly, distinguishing the amount due to the wind and that due to the ship's velocity, varying with the angle.
155. For a machine that will satisfactorily determine great depths at sea by compression, free from the errors of absorption of air, if that be employed, or from the inequalities of a spring, if that be used; and upon a scale of sufficiently large dimensions throughout to be practically useful and correct.
156. For an instrument that will detect the Local Attraction of a ship at sea with reference to the compass, by direct observation of the heavenly bodies, *without* the process of turning the ship.
157. For a method of rendering the compensating Laminæ of Chronometer Balances permanently sensitive, either by an improved method of manufacture, or by substituting a more suitable metal.
158. For the best means of neutralising the effect of Local Magnetism on the Marine Chronometer.
159. For an Artificial Horizon that can be practically employed at sea, to be used with a sextant, and which will enable the altitude of a heavenly body to be taken with sufficient accuracy for the purposes of navigation.
160. For a Self-registering Maximum Thermometer for great depths at sea, that will not be deranged by checking and hauling up the line, or by the pressure of the water on the bulb, and that will give the maximum of temperature passed through.
161. For a Self-registering Minimum Thermometer for the same purpose.
162. For the invention of a Mercurial Self-registering Minimum Thermometer.
163. For a simple Mechanical Bucket for drawing up specimens of water from moderate depths at sea while the ship is under weigh, and of such material as will not readily affect the water enclosed.
164. For an improved simple Azimuth Binnacle Compass, of moderate price.
165. For a ready means of combining the principles of Great-circle sailing with Physical Geography.

(*To be continued.*)

THE PAPER MATERIAL QUESTION.

By W. Stones.

A temporary rise in the price of paper, about two years ago, drew public attention to the subject of materials for this manufacture, which was still further excited by the appearance of an advertisement in the *Times*, offering a large reward for the introduction of some new suitable substance from which paper could be manufactured in quantity.

Numerous suggestions from all parts of the world having been the result of this announcement, it may not be inopportune, now that the agitation has somewhat subsided, to give a short *resumé* of the whole question, whereby in future much valuable time and money of projectors may be saved, by their becoming acquainted with the results of experiments which have been tried without success, or, if not tried, with the reasons why the propositions contain in themselves the elements of certain failure.

For convenience, I propose to discuss the matter under the several aspects which it naturally assumes, according to the particular point of view selected.

Can it be made into Paper?

This is the first question that presents itself to suggestors, and the reply may be made generally, that almost every vegetable fibre is capable of being reduced to pulp and converted into a substance upon which writing with pen and pencil can be inscribed, or used for some of the various other purposes to which paper is applied. Plantain fibre, hop bine, peat, thistles, nettles, straw, and sawdust, are a few only of the many articles which have been experimented upon, and for many others the curious and interesting book by M. Schaffer, published at Ratisbon, in 1765, and now in the library of the Society of Arts, may be consulted. The good man seems to have been possessed with quite a mania for converting into paper every substance he could procure.

Peculiarity of Rags as Paper Materials.—A peculiar and important advantage attending the use of rags consists in the circumstance that, in their conversion from raw vegetable fibres into woven fabrics they have undergone a thorough cleansing and separation from refuse, a result which would otherwise have to be attained at the paper mill; and the cost of such operation is included in the price paid for the manufactured goods, when purchased as articles of dress, or for other purposes, and no part of the expense attending the process is borne by the paper.

Should the paper-maker, however, resort directly to the vegetable substances in their natural state of growth, the whole cost of the conversion of the raw fibre into paper would have to be defrayed by the paper produced.

This may be illustrated by tracing the course of a single article of apparel, as a shirt; when bought new, the cotton or linen has been gathered, cleansed, spun, woven, in fact, half made into paper; the expense of these operations being paid for in the purchase-money of the shirt, which is regarded by the buyer and seller as the final object of these processes, no consideration that it will make a few sheets of paper when worn out ever entering into their calculation.

Moreover, no other manufacture competes for worn out linen and cotton garments, they being neither ground into shoddy and worked up again into cloth, as old woollen garments of some descriptions, nor used for manure as other woollen goods, and even tinder is becoming a study for antiquarians.

THE LOWEST PRICE OF RAGS.

In estimating the probability of a new material succeeding as a mercantile article, it is desirable to ascertain how its price may range, and whether it could successfully compete with rags when at their minimum price. What is meant by the minimum price of rags?

We have seen that rags are worthless, except for the purposes of this manufacture, and they are necessarily produced in large quantities.

In all civilised countries there is yearly produced a certain fixed average crop of paper materials, the produce costing nothing, and only requiring the payment of wages for the harvest labourers.

Who are they, and how are they paid?

In general it may be taken, that when articles of dress have served their purposes as apparel, they become the perquisites of the family servants, who preserve them until the periodical visit of a rag buyer. He, in his turn, accumulates the small parcels thus obtained, until, eventually, the quantity may be worthy the attention of the paper manufacturer.

The lowest price of rags then, in any given locality, will be the remuneration which the house servant and the rag collector expect for their trouble. If the rag collector will not pay sufficient to induce servants to save the articles as they are discarded, the dust-heap or the fire will probably be their destination, and should he not realise sufficient profit, his rounds will be neglected for some other employment.

It will be evident, also, that in old and populous countries, where wages are lower than in many new countries, the perquisites thus obtained will form a considerable per centage of the ordinary wages, and this item will receive attention; but, in a new country, with wages high, these small ekeings-out will be disregarded, and, by consequence, makers in the former countries will have a larger supply of materials than makers in newer countries.

Successful new materials, even with an ample supply, would not *supersede* rags until they had driven rags down to such low prices, that the classes named would cease to save and collect; but the new articles must also be prepared to fall even to a lower price than the rag minimum, otherwise rags would still be employed.

If, when a rag of a particular quality is 16s. per cwt., a new material were to be introduced at 12s. per cwt., (it is assumed that the expense of manufacture would be the same in both cases) the rag would also go down to 12s.; that is, if 12s. per cwt. would remunerate the servant saver and the collector; and so on, down to the lowest compensating price, when, ceasing to be worth collecting, the rags would be wasted and the new materials used, a state of things not very likely soon to occur.

SOURCES OF SUPPLY.

England produces rags in large quantities annually, the staple materials being, for the finer papers, old linen and cotton garments, and the refuse of the flax and cotton manufactories, particles unsuitable for spinning and weaving; and for the coarser descriptions of paper, old rope, bagging, and similar articles.

Large supplies are also drawn from North and Central Germany, nearly 12,000 bales, equivalent to 1,500 tons, having been shipped to the United Kingdom from one port, Hamburg, in the first six months of the year 1856. Also from the South of Germany and Hungary, *viâ* Trieste, and from Italy, through Leghorn, large quantities are introduced. Many of these being of linen and hemp fabric are useful in imparting strength to paper, when mixed with English rags, of which the preponderating supply is of cotton.

Russia, also, exports large quantities of strong rags of inferior quality.

France, Belgium, and Spain prohibit the exportation of rags, and the paper makers in these countries have thus a monopoly of the rags produced therein, and should their home supply be insufficient, and the foreign markets be lower, the importation of a small quantity restores the balance of supply and demand. The tendency, therefore, in the countries named is to a low and uniform price.

In Germany, rags are very carefully collected, and the amount realised for worn garments would seem to be of consideration to the poor families.

The makers in the United States not only consume all the rags collected at home, but compete with England in the European markets, as many as 2,600 bales having been shipped thither from Hamburg in the six months ending 30th June, 1856.

The American vessels convey bulky goods to Europe, as cotton, tobacco, sugar, and return either in ballast, with emigrants, or with manufactured articles occupying small space. Rags are therefore taken in the vacant room at a low rate of freight, frequently not much more than the carriage to England.

SCARCITY.

Much misapprehension has been caused by a vague or general use of this word, and without attempting too strict definitions, it appears to be capable of three limitations in its application.

1st. *Natural or Absolute Scarcity.*—Were a maker to commence the manufacture of paper in Australia, he would soon find that the small population, busily employed in profitable occupations, neither produced nor collected enough rags for his mill; every man would be more willing to buy and read the newspaper when printed, than undertake to collect the rags to make it with, or even to preserve those produced by his own wear. This would be a case of positive, absolute scarcity, and the maker would seek to obtain some new material, as a *substitute* for rags, not an *accessory*, for he would most probably obtain none of the latter.

True, he might compete with the other fields of labour, and offer such a high price as might induce some persons to collect; but the trouble and expense in obtaining a sufficient supply of one class would be such as to preclude the possibility of success, and this must be the case for some years to come. It must be remembered that he could not use one description of material and make writing papers one week and brown papers the next; the machinery once used for the latter, would be spoilt for the former.

2nd. *Partial, or Divisional Scarcity, or Deficient Supply of a particular Class of Rags.*—This may be illustrated by reference to the case of the United States, where there is a comparatively and increasingly large reading public. Rags are produced in certain average proportions of quality, which cannot be altered, nor can the supply of any one sort be arbitrarily increased; but the demand for one description of paper, say printing paper, may increase in greater ratio than the production of the class of rags from which it is generally made, and possibly greater also than the demand for writing paper, hence there will be a comparative deficiency of one sort of rag, although there may be an ample supply of superior rags, which, if used, could only be used at a loss to the maker, or by increasing the price for that description of paper, causing printing paper to approach the value of writing paper. And so far as this scarcity obtains it tends to permanently enhance the price of that one sort of material.*

3rd. *Temporary, Local, and Speculative Scarcity.*—Disarrangement in another manufacture may interfere with the paper material market, thus the strike at Preston stopped the local supplies of cotton waste, and the manufacturers who used that article had, for a time, to employ some other material, the price of which, to all, was thus temporarily raised by their competition in the market.

A drain of one description of rags may be effected by commissions from abroad. Orders may be received in England for the shipment to the United States of certain sorts at given prices; this demand will keep up the prices of that description, while others may decline, and, for reasons previously stated, it would not answer to use a better material, and, by the natural laws of manufacture, the lowest possible quality for the desired result is generally used, therefore a worse could not be employed.

Commissions from the United States and from England frequently affect the foreign rag market for one or two qualities, the others remaining quiescent. By the well-known laws of trade the increased demand for one sort of rag, from the causes named, or any other, raises the price of the whole of that description much higher than merely in the ratio of such extra demand, buyers being anxious to secure and engage supplies prospectively at the present rates for fear of further advance, and possessors holding back, thus conferring a speculative value on the goods temporarily in request.

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* Of the 2,600 bales of rags shipped from Hamburgh to the United States, in the first half of the present year, the large proportion of 1,500 were suitable for making low printing paper only, costing in the port of shipment not more than 10s. 6d. per cwt., the Americans thus endeavouring to make up for the deficient supply of their own production of low goods by importation.

For the most part suggestors of new materials have generally committed the error of assuming the announced scarcity to be what I have termed absolute, and thus mistaken their vocation, which was not to *provide something at any price, but a suitable material at a low price.*

Why Proposed Substitutes for Rags have not been brought into Use.

During the last two years, at least fifty different suggestions have been made, and if a few are specified, it is not for the purpose of censuring the authors, but for the guidance of future projectors.

One gentleman proposed thistles, showing a piece of paper, alleged to have been made therefrom in Hungary, and stating that they could be gathered for nothing everywhere.

Without entering into the question of their suitability, it was pointed out, that, although a farmer might, at present, disregard these weeds, if he found them being collected for some useful purpose he might probably begin to think that he could sell them, and so thistles would acquire a money value, and on the proposer being invited to state his price for the delivery of three or four tons of thistles weekly he began to falter, and declined this necessary part of the venture, but still thought the " idea" worth a good deal.

Another considered that hop-bines would answer admirably; to him it was remarked, that hop-bines were grown in certain localities only, and therefore could afford a very partial supply; that the proposition was not new, had been tried, and even patented, but not carried on, the proposer having only got as far as the " idea," and not having made up his mind how he should treat the material, whether chemically or mechanically; he retired to ponder over this part of the invention, and no more has been heard of his project.

Several instances have occurred in which the projector produced two or three table spoonsful of material, but what it was, whence it came, he declined telling, and how much chemicals had been used he did not know; he had only *just* boiled it three or four times, and used a little acid, and a little chlorine, and so on. On being invited to multiply the firing and chemicals in the proportion of the small quantity exhibited to the tons which must be manufactured to render the matter profitable, the unpalatable conclusions were ignored, even after allowing a large margin for the difference between working several tons and experimenting upon an ounce.

An opinion was always solicited on minute specimens, but all sorts of objections were made to the practical mode of testing the question, by making a ton into paper, paying all the expenses, and ascertaining the result, and yet it must be evident that to this stern trial all suggestions must come at last.

A learned and able gentleman proposed several East Indian fibres as suitable for papermaking, but on inquiring of a large Colonial broker the then current prices of the suggested articles, they were, unfortunately for the theory, quoted as realizing upwards of 50 per cent. more in the produce market for the manufacture of ropes, bags, and sacks, &c., than papermakers were paying for more suitable material.

From the West Indies, also, the Chartered Colonial Fibre Company proposed to import fibres of the plantain, bromelia, yucca, &c., and announced them as being " adapted to the production of paper of the finest quality," at the same time, in another part of their circular, they quote the value as ranging " from £80 to £120 per ton."

It is somewhat vaguely mentioned in their prospectus, after stating that part would be prepared for ropes, &c., that " other portions" are intended " to be applied to the manufacture of paper, of one or more classes."

Until some of the Company's produce is actually in the market, it is difficult to form an opinion as to the profitable working of their projects.

Elements of Success.

There are certain leading questions which every projector should investigate, and be prepared to answer to himself candidly and satisfactorily before the introduction of a new material can assume a hopeful commercial aspect.

1. *The cost or value in its native state or locality.*—It is evident from what has been already stated, that, allowing the article to possess a suitable fibrous character, yet its value for other purposes may be so great that it cannot compete with rags.

As an illustration, the cost of new flax fibre would be too high to admit of its use; on the other hand, straw, without reference to other circumstances, but simply regarding its abundance and price, may be said to be promising;—in the flax the fibre itself is generally expected to pay part of the expenses incurred in growing the plant, the seed paying the residue; whereas, in the other case, the straw, although of importance as litter, is not so much expected to bear the burden of production, the wheat being the remunerative substance.

Peculiar circumstances, such as fiscal arrangements, may, in some instances, lead to the use of an expensive article, which otherwise would not be employed. The duty of 30 per cent. levied on English paper imported into the United States has this double effect;—it enables the American papermaker to use a more valuable material than the English maker can afford when shipping his goods to the American market; the former can thus give the American cotton manufacturers a comparatively high price for damaged and inferior cotton, and he therefore does not work his cotton up so close as the English manufacturer, but makes a choicer selection, throwing out the inferior portions, which are purchased by the papermaker.

By consequence the better quality of American cotton goods, compared with the English made at the same price, causes them to be more approved in India, to which large quantities are exported by both countries.

It is evident that this must be effected at the expense of the American consumers of writing paper, who pay dearer for that article than they need; nevertheless, while the duty remains, these curious results follow.

2. *Its abundance or scarcity*—Many of the substances named would be too scarce to be brought into extensive use. Thistles and nettles may be taken as types of the scarce class, for it must be remembered that it is not the fleshy parenchyma of plants that is required, but the fibre.

3. *Cost of carriage.*—This item attaches heavily to foreign materials. With good writing paper rags at £25, and printing paper materials from £9 to £17 per ton, in England, according to quality, the freight and expences upon new articles, say from India, averaging from £5 to £8 per ton, renders the competition severe, and limits the expectation of relief from that quarter, unless some very superior article were discovered, which could be shipped there at an exceedingly low price.

From other countries the freight and expenses would not be so high; but still they would form a large per centage of the value, and by so much reduce the chance of successful introduction.

4. *The per centage loss sustained in being converted into paper.*—Rags lose to a greater or less amount, according to quality, in the process of manufacture, and more than two tons of straw are required to make one ton of paper.

Assuming a new imported raw material to be of medium waste, say only 30 per cent., the additional freight alone, on account of this loss, would enormously increase the price of the resulting paper, according as freight might rule at the time of shipment, thus precluding its use, except for a high class of paper.

5. *The Chemicals and Machinery necessary to make the fibre into paper.*—The manufacture of paper is partly a chemical and partly a mechanical process.

In the case of fine rags, the tearing up of the material into pulp is accomplished in machines or engines, which would be unsuitable to the beating up of rougher fibres; hence, if such were introduced, additional preliminary machinery would have to be erected, increasing the already large expense of this item.

If, on the other hand, an article of more tender fibre than usual be employed, such as straw, which can be ground with little expense of power, then the chemicals may be excessive, and become a serious, if not the preponderating element in the cost, every ton weight of straw, reckoning it at 40s. per ton, and making only half a ton of paper, requiring 70s. worth of chemicals to effect its conversion into writing or printing paper.

Strange to say, I have never met with an instance in which the proposer could give the slightest estimate of the cost of working his own pet material.

6. *The quality of the paper produced.*—A short time since some paper was experimentally manufactured from wood. The question will suggest itself, Why, with a plentiful material, the carriage moderate, and working expenses not particularly heavy, was not the manufacture prosecuted?

I apprehend the reply is simply this, that the quality of the paper produced was inferior to the rag paper offered in the market, at the same cost of production.

That great jury, the public, right in the main, in the trial Rag *versus* Wood, decided in favour of old rags against its aspiring, though more expensive, wood opponent. Many other similar instances might be quoted.

Progress and Impediments.

On a careful investigation of the price of rags during the last fifty years, it appears that a gradual diminution in the value of the better class of materials, suitable for the manufacture of writing paper has taken place, but of the lower class, in consequence of the increased numbers of the reading public and improvements in bleaching, there is a tendency to spring upwards in value, and it is more especially in reference to this medium quality of materials that every encouragement should be given to feasible projects for keeping down their price, by increasing the quantity available.

Few complain of the price of writing paper. It is the high price of printing paper which is injurious to so many interests; and it is this sectional deficiency which is to be apprehended more than an absolute deficiency, because, while improvements in the machinery for making and printing paper, and the extension of education and diminution of postage, have increased the consumption of materials, it must be borne in mind that this demand has been to a great extent met by the increased rag-producing power of the community, by the expansion and cheapening of our linen, cotton, and hemp manufactures.

Of the articles which have been yet suggested, it appears to me that the Mississippi cane brake, among the foreign substances, and, of home materials, straw, offer the most promising field.

The former grows annually to a large size, and only requires cutting. The gentleman who exhibited the paper made therefrom, and proposed to ship it to this country cleared of its unsuitable matter, quoted a price at which it might be rendered available.

It does not appear quite clear, however, why, if the operation of half-cleaning could be profitably performed in the United States, the second portion of the manufacture should not be also effected, and the paper imported, the duties on foreign and English paper being now equalised.

Straw abounds at home, and the price is low. The chemical part of this manufacture, although at present objectionably expensive, is being reduced by gradual improvements in the process, and the specimens produced are as satisfactory as the recent introduction of the system could lead one to expect; in fact, paper from this material, although short in fibre, possesses some peculiar advantages. Sold at the rate of an ordinary printing paper, it can be both printed and written on with ease, which cannot be asserted of a rag paper at the same price. It is therefore peculiarly adapted for ephemeral purposes. From sixteen to twenty tons are now manufactured weekly in this country.

But some literary men, who have "fed of the dainties that are bred in a book, and eat paper, as it were, and drink ink," will exclaim, "Why, then, is the staple of our existence so dear, if rags cost nothing except the trouble of collecting, and straw is so cheap?"

It may be trite to remind such of the saying, that a hare and eleven penn'orth of sauce are worth a shilling; but, in truth, there are many other elements entering into the production of a sheet of paper besides rags: wages, interest on outlay for machinery, wear and tear, chemicals, coals, colouring matter, sizing materials, profit, and above all, crushing all, the Excise duty, amounting to between 20 and 30 per cent. upon all the printing paper used, the selling price being from 6d. to 9d. per lb., out of which the duty absorbs within a shade of 2d.

On packing papers it is a much larger per centage of the value, and on writing paper less, but on all it is very oppressive.

In the foregoing observations, which could have been more readily extended than condensed even to their present length, I have endeavoured to refer to most of the mistakes prevalent on this many-sided question, and I trust, in studying brevity, I have not missed explicitness.

Colonial Correspondence.

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LABOUR IN OUR TROPICAL COLONIES.

Sir,—The general question mooted by Mr. R. Temple, in his letter, which appeared in the last number of the *Journal*, involves too wide a field for discussion in your columns, but there are one or two points on which he has fallen into error, and which I think require correction.

The want of labour in our colonies is the evil stated, and an explanation of the causes is attempted.

It is true that, on attaining freedom, the negro was unfitted for continued industry, but it is a mistake to suppose that his love of ease leads him to exact exorbitant wages. Mr. Temple himself states the average rate in Antigua and Barbadoes to be from 5d. to 8d. per day, and in Jamaica from 10d. to 1s. It is not the amount demanded, but the unsteadiness of the supply, that injures the prospects of the planter.

Again, it is true that by the sale of waste mountain land, in a few of the islands, the negroes were withdrawn from the plantations, but it is a mistake to assert that the purchasers intended to "found a family," or ever dreamt of "transmitting to their descendants the paternal estate." Mr. Temple shall once more correct himself:—alluding, in another portion of his communication, to the habits of the negroes, he says:—"If they have land of their own they *will not* cultivate it to any useful purpose. A few yams, &c., are all that they will grow, and for these little or no labour is required." Had the feeling above mentioned been the guiding impulse of the small freeholder, there would have been no cause to complain of the result. It is the wasteful system of temporary squatting which causes so much evil to all sections of society.

The third inducing cause specified is as novel as it is striking. Mr. Temple has resided for some years in British Honduras, but he speaks confidently on the condition of the West India colonies in general. I resided for several years in Jamaica, but until I read the letter on which I am commenting, I never heard the suggestion that the standard of education in the colonies was too high. I profess not, however, to pass even an opinion as relating to any other colony than Jamaica. There the *want of education* has been a deep cry ever since emancipation, and I could quote largely from the local journals in support of this statement. I agree with Mr. Temple as to the degree of education required, but I cannot think it necessary to join in his remonstrance against the evil of cramming the negro mind "with metaphysics and logic, history and astronomy, composition and poetry, Latin and Greek, the niceties of grammar, and the subtleties of style."

Passing from the causes of existing evils, the question is stated, "Whence is increased labour to be produced?" and Mr. Temple endeavours to furnish a reply, as far as regards Honduras.

His local knowledge entitles him to the credit of authority, when he points to the 80,000 Indians in Yucatan. If it be true that these people "would be glad to escape from their oppressors," I should have thought such a supply amply sufficient for some years to come. But the proposed new "colony" of Honduras is to draw a further supply from its prostrate sister colonies. "A mercantile house in the City would send vessels to Antigua, Barbadoes, Jamaica, and other islands, and give to labourers a passage to Honduras." This would be a startling statement to the poor old colonists, if there was a shadow of feasibility in the scheme.

We are told that "there are in Jamaica a large number of Indian coolies altogether unemployed. They are most of them tall, stalwart, muscular fellows, and capable of doing a good day's work. They have not been overwell treated. . . . . The negroes would not fraternise with them, and they were consequently (?) thrown on their own resources in a strange country. These unfortunate and abandoned creatures are not, as it has erroneously been said of them, unwilling to work; although it is by no means improbable that, having been so long unemployed, they may have contracted habits of idleness."

It will be well for the "mercantile firm" to postpone the departure of their vessels, not only until the settlement of Honduras is placed in the list of British colonies, but until they shall have obtained further information relating to the unemployed labourers in Jamaica.

I am unable to account for so serious a mis-statement, made with so much particularity by your correspondent. In the first place, there are no coolies in the condition specified, and the vagrant Chinese are utterly helpless, having defied the efforts of the Agent-General of Emigration, and of their own leading countrymen, to settle them in a plantation for the cultivation of rice or ground nuts, which plan was set on foot at the public expense, expressly to attract those who would not work on the sugar estates.

The assertion, that the industrious coolies were ill-treated or neglected in Jamaica, is wholly unfounded. The majority of them returned, greatly enriched to their native country, and those that remained (man, woman, and child) received a pecuniary bonus in lieu of their passage-money.

Should any scheme be set on foot to entice the negro population from the island, I think I can forewarn the parties of a complete failure. The Jamaica people have spent hundreds of thousands of pounds in immigration, and hundreds of thousands of labourers are still required. I hardly think that any mercantile firm would be bold enough to embark in such an attempt to rob Jamaica to enrich Honduras.

It is interesting to observe how widely different are the views of men as to the remedy for existing evils in our West Indian colonies. Mr. Temple, together with many others, advocates immigration of unskilled labour, involving a mixture of races, and the importation of every variety of heathenism. Another view is advocated by a large class, who seek to arrest the influx of such an accumulation of ignorance and vice. If you can find space for the inclosed abstract of a paper lately published in the Jamaica press, you are welcome to its use. The signature will not be unknown to Mr. Temple.

I am, &c.,
LEONARD ROWE VALPY.

5, Spring-gardens.

"How to procure labour for the profitable working of his large fixed capital has long been the all-absorbing question of the proprietor, and no progress has yet been made towards a solution of it. Meanwhile ruin is creeping like a leprosy over our future. . . . Several elements enter into the labour question which have not yet had that attention which is essential to the attainment of just practical conclusions upon it. The condition out of which we have emerged had laws of its own, and gave form and body to a condition of the society which prohibited the advancement of the labouring classes, although these formed the numerical majority. The course of that old economy was to concentrate on single plantations bodies of labourers as large as the landholder's purse could procure; and according to the extent to which he was enabled effectually to cultivate the lands immediately surrounding his building and machinery, so were his profits. . . . In a state of freedom, these considerations must in a great measure be reversed. When the quondam slaves have thoroughly understood their new position all considerations affecting the capitalist will be lost in the consideration of what is personal to themselves. *He* is no longer the lord of *their* movements, nor *they* the creatures of his will; so that motives must be presented to induce them to labour for him at such times and places as *he* shall prescribe, instead of for themselves at such time and places as *they* shall please. This is the true complexion and relative position of capital and labour in this and all other free countries, with which, therefore, we must deal. . . . In agricultural *Colonies*, where the population is thin and the land is cheap, we find the proprietor compelled to restrict his enterprise much within his capital and ability. Were a few wealthy farmers to attempt in one of the new States of America to secure the permanent labour of hundreds or even fifties, to their respective farms, they would utterly fail, unless they were prepared to pay wages far exceeding what their profits could afford. Accordingly agriculture in such countries is upon a corresponding scale of moderation. . . . Hundreds of Coffee and Sugar plantations have been given up; the labourers disengaged were free to do as they pleased. And what did they please? Not to go to the remaining plantations, but turn to on their own account. Hence the anomaly of a cry of "no labour in the country," at the moment of tens of thousands of labouring men being thrown loose from all engagements. Several remedies have been proposed, of which the leading has been immigration of people of a low order, unable to speak our language, but willing to be bound to plantation labour by indentures for terms of years. This scheme has involved the island in a large amount of debt, without apparently having made the desired impression on the labour market; and been accompanied by an appalling amount of suffering, destitution, and mortality. . . . But I may be told that planters do succeed in making large crops, and consequently in attaching large bodies of labourers to their estates. Yes! But with what an effect this is done, and in how many cases with no profit at all; and what little likelihood is there of such efforts being permanently successful, and what a state of society is it creating? These labourers are not located on the estates. They are gathered from a circle of from twenty to thirty miles around the plantation. Fathers and mothers, for example, actually leave their houses in the parish of Portland to labour on the estates of Plantain Garden River and other estates thirty miles off. The working plantations thus become hotbeds of all that is irregular and immoral, and in the highest degree prejudicial to the domestic condition of our peasantry. The Rev. John Cowan, one of the most respected Scottish missionaries, told me that on this account the people of his charge, generally, would not work themselves, nor permit their children to work on the plantations. . . . . The agriculture of a free country must rely on voluntary labour, and the more skilled and intelligent the better. If this be admitted, one of the earliest remedial measures of Government will be to seek for the proper class of emigrants in the Canadian refugees, whose habits are good, and who have been accustomed to a superior style of labour, and to a more civilised social condition than ours. . . . .

"I need not go into a dissertation on the central factory system; but I may ask whether, were an estate with its cane-fields brought under cultivation by a smaller class of capitalist farmers, each of whose profits would be realised, and labour ended when his fields of canes were handed over ripe to the attorney of the proprietor, there would not be a greater facility of raising and ultimately of manufacturing, by the aggregate of what such tenants could and would do, larger crops of canes for the estates? . . . .

"The present system of plantation labour is demoralising and destructive of the amenities of domestic life. The usual wages of a shilling a day is wholly inadequate to support a family, unless combined with a house and provision ground in the immediate vicinity. . . . .

"Where large bodies of people are required, the proper course is the establishment of villages for the location of labourers' families, and for tradesmen offering their workmanship, and shops their variety of merchandise, as the proper stimulants to active and incessant industry. It may be replied that the negroes, generally, are not much bound by common motives or family ties. So much the worse. Are we to be contented with such a condition?" . . . . Whether men will have it or not, the *material* is ever dependant on the *moral* condition of a country—and that by an eternal law of the Creator. Some cannot, and others will not, see this; but results will compel its acknowledgment. . . . While other colonies, with not half her natural advantages, or half her population in proportion to area of land, are advancing in wealth and civilisation, she is sinking into destitution—yea, and will sink until she gets a Government whose ideas of remedial measures shall extend beyond the mere regulation and exaction of revenue, and include the improvement of the people, and their assimilation to those of other well-doing countries as primary objects.

"W. W. A."

Home Correspondence.

FLAX SCUTCHING.—M'BRIDE'S MACHINE.

Sir,—From the great interest that has been awakened of late, regarding the supply of flax and other fibres for manufactures, by the narrow escape we had in the last war, and particularly from the severe trial the flax-spinners experienced, whereby many of long standing failed, such attention was aroused relative to the production of flax at home, and of it and other fibres in our Colonies, as should not be allowed to cool down, now that the danger appears to be past.

For many years I have taken a great interest in, and have paid much attention to, the above subject, and therefore I have been led to watch closely any improvements taking place in machinery for cleaning, or scutching flax; and, having had some experience with M'Bride's first patent machine for such a purpose, it led me to see that, if a few defects therein could be got over, it would be, as nearly as possible, a perfect machine.

While on a journey to the North lately, business led me to cross over to Belfast; and having heard, some short time previously, that a *second* patent had been secured for M'Bride's machine, whilst in Belfast I called upon the Messrs. M'Adam, the spirited engineers there, who had brought out the improved machine, and those gentlemen afforded me every facility for inspecting and making full trial of the capabilities of the machine; so that, having made a careful trial of it during two days, I felt convinced that it was one of the most important movements yet made in the flax trade: and it is now my deliberate opinion that, by means of this machine, it will be possible to prepare and dress flax fit for the English market in any quarter of the globe where the plant can be grown, without regard to the unskilfulness of the inhabitants. The vast quantities of flax straw now thrown away in India could, by the above invention, be made productive of a profit that would induce cultivators generally to secure the same benefit, and if the vast capabilities of that magnificent, but much neglected, part of our possessions were developed, even as regards flax, thousands of tons might annually be produced, that would materially augment the wealth and comfort of the producers and the manufacturers.

This improved scutching machine is less expensive, more simple, more easily managed, and occupies less space and power than did the first machine, although doing fully as much work; it is perfectly self-acting, merely requiring the flax straw to be put in at one side, and the flax, finished, is taken from the other side. From the moment the straw enters the machine no further attention is necessary, and no skilled workmen are required, as any boy or girl of fourteen or fifteen years of age can be taught to feed it in two or three hours—the machine does all, and delivers the flax well scutched.

All clasps or holders for fastening the straw are dispensed with, the attendants are not liable to accidents, and the important object of security from the annoyance of dust is attained, which is so injurious to the health of the workers; for, by simply elevating the machine a few feet, the whole of the tow and the scutching dust pass away beneath, so that, from witnessing this trial, I feel convinced, by the clean fibre yielded, and the small quantities of tow and waste left, flax can be scutched with quite as small amount of loss as by the most careful handling of skilled scutchers, which shows the great advantage of using M'Bride's machine, whereby unskilled labour, at 10d. or 1s. per day, does twice the work of skilled hands at 3s. to 3s. 6d. per day, and the machine can be easily set, so as to dress either green or unretted straw, as well as either cold or hot-water steeped.

The space it occupies is about 17 feet by 10 feet; the holding of the flax is effected by means of a horizontal wheel of about three feet diameter, having on its circumference two grooves, in which grooves, by endless ropes, kept tight by a counter weight, the flax straw is held firmly between the grooves and ropes, to be taken slowly round to the breakers, or scutching blades; *here* the great improvement occurs. These blades are fixed in a peculiar manner, on two horizontal shafts, parallel to each other, but on different levels; each shaft carries arms, placed opposite to each other, so contrived as to pass each other without coming in contact; to these arms the scutching blades are fixed, passing each other in intersecting circles, the intersection taking place immediately *below* the circumference of the holding wheel. The blades strike the flax rapidly, but gently, on either side alternately, whilst it is passed slowly under their action in the grooves of the holding wheel; and, being thus cleaned at one end, it is grasped at the proper moment by the holding apparatus of the second pair of scutchers, being counterparts of the first, but so set as that the other end of the straw is effectually cleaned, and thus the finished fibre passes out ready for the manufacturer.

Messrs. M'Adam and M'Bride, in their own statement of performance of the machine, modestly put down 500 lbs. of fibre cleaned in a day of ten hours, but the result of the two days trial I witnessed gave us, on the first day, 800lbs. of clean fibre, or an average from each cwt. of flax straw of 30lbs. clean flax, but on the following day, with increased speed, 900lbs. were produced in ten hours, on an average of 29lbs. flax from each cwt. straw; yet, by the present expensive mode of hand-scutching, from 20lbs. to 22lbs. is reckoned a fair yield from each cwt. of the straw, showing most strikingly the great advantages derivable from M'Bride's new machine. Thinking that some information relative to the profitable nature of flax culture may be appropriately inserted here, and may also be interesting to some readers, I have copied the following report, made by Mr. S. Druce, of Ensham, near Oxford, to the Royal Agricultural Society, dated 26th Feb., 1851, and also the comparative expenses of scutching by machinery, and by skilled labour:—

MR. DRUCE'S REPORT, DATED FEBRUARY, 1851.

DR.	£	s.	d.
Rent, at 48s. per acre, 5a. 2r. 3p.	13	14	9
Taxes, at per acre, 6s.	1	14	4
Flax seed, 13½ bushels, at 9s.	6	1	6
One ploughing, at per acre 10s.	2	17	3
Sowing and harrowing, at 1s. 6d.	0	8	0
Weeding do. at 2s.	0	11	5
Pulling flax, at 14s.	4	0	1
Carting and stacking, at 4s.	1	2	10
Thrashing	5	7	1
Winnowing	0	12	6
To balance (profit)	47	16	4
	£84	6	1

CR.	£	s.	d.
Sale of produce, flax seed 116¼ bush. at 8s.	46	10	0
Do. straw, 12t. 2c. 2q. at £3	36	7	6
Chaff, at per acre 5s.	1	8	7
	£84	6	1

The soil on which the flax was grown consisted of a deep loam.

To estimate the profitable result of scutching by M'Bride's machine, it will only be requisite to take out the quantity and value of straw from Mr. Druce's report above, and allow two tons of clean fibre therefrom, at a cost of £9 per ton of flax for the processes of steeping and scutching, which will show a net profit of £45 12s. 6d., valuing the fine fibre at only £45 per ton.

The following are the comparative results of scutching flax by patent machine and hand-labour:—

Observe:—The rolling or breaking the straw being the same either way, it is not taken into account; the prices attached to the estimate for hand labour are stated to be the average paid throughout England.

	£	s.	d.
Hand labour; scutching 40 stone, 7½d., or 640lbs. clean fibre	1	5	0

M'BRIDE'S MACHINE (NEW PATENT).

	£	s.	d.
Yield in one day of ten working hours; 40 stone or 640lbs., 2 feeders, 1s. at 10d.	0	1	10
1 straightening ends	0	1	0
1 attendant	0	0	10
2 dressers at 3s. 6d.	0	7	0
Wear and tear	0	1	0
	0	11	8
Balance in favour of machine	0	13	4
	£1	5	0

In the important question of flax scutching there is the great cause of humanity involved; it is not so much the money-saving on the cost of working by the new patent scutching machine that should be regarded, but the difficulty also, of securing skilled hand-scutchers, and of keeping them to their work when once trained. Let any reflecting person go for a short time into an Irish scutching mill, and see if he would not be glad to retreat out of the fog of fine dust in which he would be enveloped. Much is said about the drunkenness of the hand scutchers, and the impossibility of keeping them regularly to their work; but, let it be considered, that these poor fellows stand close to the breakers, flying round like the sails of a windmill several hundred times in a minute, and casting off in sticks and dust eighty pounds weight, at least, to every 32lbs. of fibre cleaned; and further, it is not merely one man in a room, but often twenty or thirty, and in some places many more, confined to one place with continual dust to aggravate thirst, and, consequently, the desire to quench it. My own wonder is that the men can be got to work at all, and for this reason, a person who might start a hand-scutching mill will not find it answer; one might as well try to persuade some of our sporting friends on a *Derby Day*, driving along a thronged and dusty road, that they do not need anything to wash the dust down as to persuade these poor scutchers from drinking. In most cases they lose their appetites, then their energy, and thus substitute the stimulus of drink to enable them to toil on in their unhealthy employment. Therefore I say that Mr. M'Bride, for his great ingenuity in contriving, and the Messrs. M'Adam, for their skill in bringing the new scutching machine to perfection, deserve the fullest support, and the best thanks of all who have the success of the commercial and manufacturing interests at heart, combined with the improved condition of our operatives. Thirty years' experience amongst working-men convinces me that nothing is lost on the part of any employer, by studying the comfort of his people.

EDWIN WARD TRENT.

Park Hemp Works, Old Ford, Sept. 29, 1856.

Proceedings of Institutions.

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BUCKS AND BERKS LECTURERS' ASSOCIATION.—The Second Annual Report of this Association, recently published, states that, whereas when the first Report was printed, in September 1855, the Association had but one Institute, and one reading-room and library in union; one circulating box of books; and had delivered a course of lectures in one school room; now, three Institutes (Egham, Windsor and Eton, and Staines), six reading-rooms and libraries (Burnham, Maidenhead, Colnbrook, Eton, Chalvey, and Cumberland Lodge), and three schools or class rooms (Bracknell, Clewer-road, and Shaw-farm), are in union with the Association. In the establishment of four of these reading-rooms (Burnham, Colnbrook, Eton, and Chalvey), the Association has asssisted by grants of money. The circulating libraries of the Association contain about one hundred and fifty volumes; these have been made use of by the reading-rooms at Burnham, Maidenhead, Colnbrook, and Chalvey. Besides these, his Royal Highness Prince Albert has recently most kindly presented the Association with fifty pounds worth of books for circulation. In the course of the past winter, fifty-nine lectures have been delivered by members of the Association in the various Institutes, &c., in union. The committee have much wished to add lay members to its number, as vacancies occurred. Accordingly, Mr. Philips, Honorary Secretary to the Windsor and Eton Literary Institute; T. H. Stevens, Esq., Eton College; and more recently, W. Johnson, Esq., Eton College, have been elected, with much benefit to the Association. It is intended to carry out this principle further. Another way of increasing its usefulness has been opened to the Association. Annual examinations have been established by the Society of Arts, for candidates from Institutions associated with it. A declaration has been signed by a large number of the most influential noblemen, clergy, merchants, and gentlemen in the kingdom, by which they agree "to regard as testimonials worthy of credit such certificates as may be awarded" by the Society. The committee of the Bucks and Berks Lecturers' Association wishing to aid as much as possible such an important object, and to give every assistance in their power to members of Institutes, &c., in union, who may wish to present themselves for examination in London, have determined to hold a preliminary examination in the spring of each year, and to open a special fund for providing prizes. The particulars of the scheme will be shortly forwarded to all Institutes, &c., in union.

Hants and Wilts.—The third annual meeting of the Hants and Wilts Adult Educational Society, and the conference of kindred associations in union with it, was held on Tuesday, in the Townhall, Basingstoke.—Among the company were, the Bishop of Winchester, the Bishop of Salisbury, the Dean of Hereford, the Hon. and Rev. J. Best, the Rev. Canon Woodroffe, the Rev. Canon Jacob, the Rev. A. Wodehouse, the Mayor of Basingstoke, Mr. W. Portal, Mr. Chadwick, Mr. Chute, Mr. H. Cole, Mr. J. E. Jervoise, &c. On the motion of the Bishop of Winchester, seconded by the Bishop of Salisbury, the chair was taken by the Dean of Hereford. The Hon. and Rev. S. Best, one of the honorary secretaries, read the Report, from which the following are extracts:—

"In presenting their report of proceedings for the year ending Sept. 1, 1856, the committee venture to congratulate the Society on the success which has attended its labours. The great work of promoting, stimulating, and aiding adult education, is not one which can be accomplished without long continued exertion and patient forbearance. There is much lost ground to make good, and prejudices, interests, and difference of views are to be overcome before we can agree upon any common platform of operations. When this is agreed upon, it will still be necessary to allow for very wide diversities of circumstances and conditions in the arrangements for carrying out our objects. Great as the improvement has been in our elementary schools in their method of teaching, and the more practical range of subjects, it may be questionable whether our greatest difficulty, the early removal of children from school, has not rather increased than diminished, and whether the very efforts we have made to improve school teaching, have not tended to abridge its duration. It is beside our office to enter into this branch of inquiry which belongs rather to the province of elementary than adult education; but as it is our duty to take up the youth as we receive him from the elementary schoolmaster, it is necessarily of vital importance to us and to our hopes of carrying on his education, that his teaching in the elementary school should be sound, enlightened and liberal, that so he may be prepared to receive without risk or danger those impressions that the opening world cannot fail to make, and that the various calls and ramifications of labour, industry and skill necessitate. It has been a question and is one to which the attention of this meeting is called, at what age for the purposes and operations of the society, adult education should be considered to commence. Fifteen is the age that has been hitherto taken, but, judging from the correspondence of many members on the subject of evening schools, there would appear to be a difference of opinion, or at all events of practice, on this subject, and as the starting point of our exertions is a matter of considerable importance, it would be well perhaps, if it be wished that any higher or lower standard should be taken, that the wishes of the society should be formally expressed. During the past year several important institutions have been received into union, while the number of schools and small country reading rooms has increased. Among the number of institutions are those of Fareham, Gillingham, Havant, Lymington, Newbury, Odiham, Poole, Ringwood, Shaftesbury, Titchfield, Warminster, Wilton, and West Cowes. Amongst the schools those of New Alresford, Beechwood, Chawton, Erchfont, Empshott, Farley, Longstock, Pitton, and Woodlands, and among the smaller reading rooms, those of Brightstone, Calbourne, Chilbolton, Longparish, and Hayling Island. . . . . . .

In book purchases for institutions in union, there has been a considerable increase. In 1855, 170 vols. were ordered by the secretary, at the desire of institutions in union, whereas for the present year, 320 vols have been ordered through the agent to the Society of Arts, 100 of which were ordered by the Book Hawking Society, but lately taken into union with us. The books so supplied to the various institutions in union, were at a reduction of 25 per cent. . . . .

At a meeting held at Salisbury, in January last, the subject of prizes was taken into consideration; and it was resolved to offer premiums for the best examinations, according to arrangements to be made by the secretaries. After considering the proposition at subsequent meetings of the committee at Basingstoke, it was resolved to carry it out by the issue of the scheme. Under these proposals, examinations were held in the week of July 14 at Lymington, Alton, and Abbots Ann. The method of conducting the examination was as follows:—An application was made to the president of the Institution to which the candidate belonged, requesting his assistance in the nomination of three members, one or other of whom would be present during the whole of the examination, and report that the answers of the candidates were given without any aid or assistance whatever. The whole was in writing. Two hours in the evening were fixed upon by the president, and allotted to each paper of questions which was sent by that day's post to the president, sealed, and with a special direction on the cover that they were to be opened in the room. The answers also were to be sealed up in the room, and returned with a certificate from the manager to the secretary by the post. Several candidates in the first instance announced their intention of standing, but afterwards, from doubt or distrust of the examination, withdrew. Finally, three members only of the Institutes of Lymington, Alton and Abbotts Ann, were examined. The examination in each case was satisfactory, and the committee, desirous of marking their approbation of the courage and confidence with which these members met the proposals of the society, and subjected themselves to an examination of which they could have no experience, have awarded to each a certificate and a prize, varying according to the value of the examination, and the number of subjects successfully handled. It has awarded, therefore, to Mr. G. F. Skinner, of Lymington, a prize of 30s.; to Mr. W. Blake, of Alton, a prize of 20s.; to Mr. W. Rowden, of Abbotts Ann, a prize of 10s., accompanied in each instance by the Society's certificate. At the same meeting it was resolved by the committee to offer assistance, in the shape of travelling expenses, to any members of Institutions in union who would present themselves for examination at the Society of Arts in June. Here, again, several were in the first instance disposed to become candidates, but afterwards withdrew: one only, Mr. John Hams, of Romsey, presented himself, and your committee are happy to say brought away with him one of the society's certificates. By a subsequent resolution of the committee, passed at the Winchester meeting, it was resolved to give a prize of books to any one earning the society's certificate, and in consequence of this, Mr. Hams will also present himself before you this day to receive his prize. Your committee consider, that in this manner they have carried out the spirit of the recommendations of the Southampton meeting, on the subject of certificates as preparatory to those of the Society of Arts, and would willingly, with your approbation, continue the same offers, and carry them still further by paying all the expenses of those who gain our prizes or certificates at the Society of Arts Examinations. While touching on this subject, it may be well to suggest to this meeting the propriety of addressing the Society of Arts to hold examinations for the south in Salisbury, Southampton, or Winchester. The last subject to which the committee would draw the attention of the meeting, is the declaration of employers of labour, by which they undertake to give value to the certificates as well of the Hants and Wilts Society as of the Society of Arts. A very great boon will be conferred on the cause of education by promoting this object, and by getting those whose attention has not yet been fixed upon it to join in this common and joint declaration of the value of a good education. A most influential declaration has been issued by the Society of Arts. The object of our declaration is to assist it by local ramifications, to enlist local classes and sympathies, and to make known the value which men of sound judgment and integrity set upon a good education."

The meeting was then addressed by the Bishop of Winchester; the Bishop of Salisbury; Mr. Cole, C.B.; Mr. E. Chadwick, C.B.; the Rev. Mr. Best; the Rev. Mr. Kingsley; Mr. W. L. Sclater; the Rev. C. Paul; the Rev. Mr. Ridley; Mr. C. Sartoris; the Rev. F. Trench; the Rev. D. Underwoode; the Rev. Canon Woodroffe; and other gentlemen. In the course of the meeting the presentation of prizes took place, the prizemen being Mr. G. F. Skinner, of Lymington; Mr. W. Blake, of Alton; and Mr. W. Rowden, of Abbotts' Ann; each of whom had passed a rigorous examination embracing the history and theory of the steam-engine, the physical geography of the British Isles, and English history during the reigns of James II. and William III. Mr. John Hams, of Romsey, also brought away a prize, and was congratulated by the chairman on being the first student from the agricultural district who has distinguished himself at the examinations of the Society of Arts.

London.—Royal Polytechnic.—A meeting was held at this Institution on Monday evening, to inaugurate a series of evening classes which are about to be formed in union with the Society of Arts. The chair was taken by the Rev. Dr. Booth, treasurer of that Society; and there were also present Dr. Spurgin, Dr. Bence Jones, Dr. White, Mr. Bidlake, Mr. Winkworth, Mr. Banister, Captain Pollock, the Hon. Captain Maude, Mr. Wentworth Dilke, &c. The number of persons in the hall was between 1,500 and 2,000.—The Chairman said he had much pleasure in giving his humble co-operation to the good work they had in hand, and in tendering them the assistance of the Society of Arts. He was glad to see the cause of mental improvement taken up by the people, because the real work could only be done by the public themselves. There was no use in waiting to see what the state would do. The government desired to promote national education, and would assist them if they could, but what hope was there of any thing being done while public opinion remained so unsettled? Whether it was Lord John Russell, or Sir John Pakington, or Mr. Fox, or any other advocate of education, the result was the same with all—discomfiture and defeat. A generation of men had been born, taught somehow, and absorbed, untrained and uninstructed, into the industrial life of the nation while this conflict had been raging; and what hope was there of its termination? It did not at all follow, that if they built a school house, appointed a master and a committee of management, procured books and apparatus of every kind, and even filled it with boys, they could induce them to learn, Every body knew that the elements of education were exceedingly nauseous, and that to acquire them involved, even in the most favourable cases, an enormous amount of mental toil and patient drudgery. They must hold out some inducement to boys to learn. Prizes soon lost their effect; the bait would seldom take more than once. Did they not all know that the average age at which boys were being removed from school was diminishing from year to year; that it had gradually fallen from fourteen down to nine, and even in some cases to eight years? While, in fact, the state was adding at one end, the public were cutting off at the other. He (Dr. Booth) believed that the law of supply and demand would hold in this case as well as in every other. If parents found that their sons could not get on in life without education, why they would endeavour to procure education for them. If young men were made to feel that industry, diligence, and consequent attainments were passports to employment, they would soon see the class-rooms not only of this institution, but of every similar one in the country, filled. But how did a young man now prepare himself to obtain employment? By pestering the members of the borough, if he lived in one, or by running after any railway director or municipal official he can get hold of—nor was he much to be blamed for this. So long as the qualifications of candidates were the last things to be considered in filling up appointments they could not expect that qualifications would be much improved. It was a great mistake to imagine that red tape was only to be seen in government offices—they would find nepotism and partiality elsewhere just as well. In short the matter came to this—if the great employers of labour desired the people of this country to be better instructed they had only to insist on a higher standard of attainments than they did at present. The Society of Arts was proceeding to test the question whether there was such a feeling in the country. If their certificates became passports to employment thousands would endeavour to obtain them. If they did not become so they would not be worth the paper on which they were written. —The Rev. Mr. Butterworth Owen then addressed the meeting, and further explained the nature of the arrangements between the classes now to be formed with the examinations at the Society of Arts, by which means a central academy of sciences will be established. He said that this attempt deserved every success, and it was clear that no one at the head of it could hope to reap any money-advantage from it, for the charge for lessons was so low, that the payments, even with success, would barely pay the expenses of the management, and, therefore, the greatest credit was due to Mr. Pepper for the liberal manner in which he had taken up the subject. He thought that authorities of all ranks ought to support such efforts in antagonism to idleness, inebriety, and ignorance. The reverend gentleman concluded by reading the following list of classes:—*Monday:* Arithmetic and Algebra, from 7 to half-past 8 o'clock p.m.; Dr. White, F.C.P., Member of the Council and Examiner in the Royal College of Preceptors; text books—Colenso's Arithmetic and Algebra. Chemistry, from 20 minutes to 9 to half-past 9 o'clock p.m.; J. C. Buckmaster, Esq., of the Department of Science and Art, and J. H. Pepper, Esq., F.C.S., A. Inst. C.E., &c.; text book—Wilson's Chemistry, by Chambers,—*Tuesday:* Geometry and mensuration, from 7 to half-past 8 o'clock p.m.; Geo. J. Tear, Esq., C.M.D., of Training College, Winchester; text books—Tate's Mensuration, and Pott's Euclid. Geography, from 20 minutes to 9 to half-past 9 o'clock p.m.; George A. Chapman, Esq., C.M., of St. Mark's College, Chelsea; text book—W. Hughes's Geography —*Wednesday:* History and literature, from 7 to 8 o'clock p.m.; the Rev. C. Boutell, M.A., Oxon; French, from a quarter past 8 to half-past 9 o'clock p.m.; Mons. G. Roublot, Bachelier es Lettres; text books—Smith's French and English Pocket Dictionary, De Fiva's French Grammar, Montesquieu's Grandeur et Décadence des Romains, and Voltaire, La Henriade.—*Thursday:* Mechanics and elements of mechanism, from 7 to half-past 8 o'clock p.m; John Bridge, Esq., M.A.; text book—Lardner's Handbook of Mechanics. German, from 20 minutes to 9 to half-past 9 o'clock p.m.; M. Heidenheim, Esq., Ph.D.; text book—Ahn's Exercise and Grammar. —*Friday:* Bookkeeping, from 7 to 8 o'clock p.m.; Alex. Macpherson, Esq., Public Accountant; text book—Chambers's Elements of Bookkeeping.—Mr. Buckmaster moved a vote of thanks to Mr. Butterworth Owen.—Mr. Pepper seconded the motion, which was carried by acclamation.—Mr. Butterworth Owen acknowledged the compliment, and some other speakers followed to a similar effect, when the meeting terminated.

The Experimental Iron Pavement laid down in Leadenhall-street, opposite the Church of St. Katherine Cree, does not exhibit that fixedness and stability so essential to be regarded in the pavement of the permanent carriage-ways of the metropolis. The various compartments in which this pavement is laid down already show very considerable indications of wear, and the vibrations to which they are perpetually subjected show a certain looseness and want of tenacity and endurance, the reverse of which is the characteristic of granite paving, especially when properly laid in the narrow-guaged courses.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, October 3rd*, 1856.]

Dated 18th July, 1856.

1690. William Leuchars, 38, Piccadilly—Improvements in locks for travelling bags.

Dated 26th August, 1856.

1993. Samuel Jay and George Smith, 246, Regent-street—An improved "facing" or covering to be attached to the outside of ladies' dresses, mantles, or other articles of attire, peculiarly adapted for the warmth and protection of the chest.

Dated 4th September, 1856.

2049. James Picken, Dunlop, Ayr, N.B.—Improvements in the arrangement of the feed apparatus of machines for threshing or separating grain.

Dated 13th September, 1856.

2144. Richard Peyton, Birmingham—An improvement or improvements in the manufacture of metallic bedsteads and other articles for sitting, lying, and reclining upon.
2146. James Stuart Vaughan, Stockland Vicarage, near Bridgwater—An improvement or improvements in the apparatus for making infusions of vegetable or other substances.
2148. Richard Archibald Brooman, 166, Fleet-street—Improvements in mills. (A communication.)
2150. Samuel Cunliffe Lister, Manningham, near Bradford, York—Improvements in preparing and spinning cotton, flax, and similar fibres.

Dated 15*th September*, 1856.

2154. Jean Baptiste Justin Lassie, 39, Rue de l'Echiquier, Paris—A new system of aerial navigation.
2156. Calvin Kline, Brooklyn, New York, U.S.A.—The improvement of mariners' and other compasses, by which the effect of local attraction is cut off or neutralized, and the compass is made to traverse more perfectly.
2158. Alexander Rowand, Glasgow—Improvements in cases or vessels for holding gunpowder.

Dated 16*th September*, 1856.

2160. Robert Elmy Garrood, Chelmsford—Improvements in stopcocks and valves for the drawing off and passage of air, gas, steam, water, and other fluids, or for any other purpose for which the same may be applicable.
2162. Alfred Vincent Newton, 66, Chancery-lane—Improved apparatus for raising water by atmospheric pressure. (A communication.)
2164. Robert Lavender, Aldersgate-street, and Edward Lavender, Aston-street, Limehouse—Improvements in raising water and other fluids, and in obtaining power thereby.
2166. Richard Archibald Brooman, 166, Fleet-street—Improvements in water-closets and night stools. (A communication.)
2168. Robert Mushet, Coleford, Gloucester—Improvements in the manufacture of iron.
2170. Robert Mushet, Coleford, Gloucester—Improvements in the manufacture of iron.

Dated 17*th September*, 1856.

2172. Robert Burns, Liverpool—Improvements in bone mills.
2174. David Crichton and James Cathcart, Manchester—Improvements in looms for weaving.
2176. Antoine Andraud, Paris—Certain improvements in wheelbarrows.
2180. George Davies, 1, Serle-street, Lincoln's-inn—Improvements in apparatus for actuating railway breaks. (A communication.)
2182. John Muir Hetherington and James Gee, Manchester—Improvements in flyers for preparing cotton and other fibrous substances for spinning.

Dated 18*th September*, 1856.

2183. Isham Baggs, Manchester-street, Argyle-square—Improvements in smelting or reducing copper and other metals from their ores, and in the manufacture of sulphuric acid in or by such process.
2184. Thomas Callender Hinde, Birmingham—An improvement or improvements in the manufacture of iron.
2185. Theophilus Horrex, South-square, Gray's-inn—Improvements in means or apparatus to facilitate the delivery of coals to cellars and other such places.
2186. Louis Jacquemier, Rome—An improved method of hardening and colouring alabaster and other gypsums, and calcareous stones and earths. (A communication.)
2187. George Hill, City-road, Derby—Improvements in feeding steam-boilers.
2188. André Gabriel Guillaumin, Paris—An improved ramrod.
2189. Richard Wilson, Oxford-court, Salters'-hall—Improvements in the construction of fire-proof floors and ceilings, applicable in part to the construction of bridges and other structures.
2190. William Frederick Plummer, St. Mary's Overy Wharf, Southwark—An improved mode of preparing hard wheat and other hard grain for grinding.
2191. Thomas Greenwood, Leeds—Improved machinery for trimming the teeth of wheels.
2192. William Henry Cooper, Manor-cottages, Bromley-hall—An improvement in the manufacture of fretwork for ornamental windows or lights, applicable also to the cutting of irregular figures in glass generally.
2193. Charles Goodyear, junr., Leicester-square—Improvements in the manufacture of penholders and handles for penholders.

Dated 19*th September*, 1856.

2194. Jean Baptiste Honoré de Roussen, 39, Rue de l'Echiquier, Paris—Certain improved apparatus for washing and cleansing ores.
2196. Charles Fréderic Vasserot, 45, Essex-street, Strand—Improvements in filtering water on a large scale. (A communication.)
2197. James Smale, Gibraltar-row, Southwark—Improvements in the mode, means, or apparatus for printing or transferring designs or letters on to glass.
2198. Pierre Laffitte, Paris—An improved engine with rotary piston, applicable to various purposes.
2201. Arthur Clark, 83, High-street, Southampton—Improvements in signal lamps.
2202. William Young, Queen-street, Cheapside—Improvements in furnaces, fire-places, and stoves.
2203. Edward Finch, Bridge Works, Chepstow—Improvements in the construction of wrought-iron masts, bowsprits, yards, booms, gaffs, and spars, and in rigging ships.
2204. George Dawes, Union-street, Southwark—Improvements in the manufacture of hats.
2205. Richard Van Hees, Manchester—Improvements in the construction of electric clocks or time-keepers. (A communication.)

Dated 20*th September*, 1856.

2207. John Sherar, Aberdeen—Improvements in oil and spirit lamps by the formation of burners obviating shadow.
2208. Richard Van Hees, Manchester—Improvements in the construction of wrought-iron wheels for railway and other purposes. (A communication.)
2209. John Naylor, Birmingham—Improvements in window fastenings.
2210. William Johnson, 47, Lincoln's-inn-fields—Improvements in steam-boilers. (A communication.)
2211. The Hon. William Erskine Cochrane, 5, Osnaburgh-terrace, Regent's-park—An apparatus for converting crude iron while in a fluid state from a blast or other furnace into malleable or bar iron and steel.
2212. Joseph Maudslay, Lambeth—Improvements in fire-places for steam-boilers.
2213. Thomas Webster Rammel, Trafalgar-square—Improvements in constructing railways and propelling carriages thereon.
2214. John Roberts and James Beech, Walsall—A new or improved railway chair.
2215. Alfred Ford, Chelsea—Improvements in dissolving vulcanized india-rubber for waterproofing and like purposes.
2216. George William Sayer, Mark-lane—Improved machinery for stopping or retarding railway carriages. (A communication.)
2217. Thomas Evans Blackwell, Clifton, Bristol—An improved mode of constructing fire flues and air passages.

Dated 22*nd September*, 1856.

2218. William Taylor, Woodhall-cottage, Shipborne, Tunbridge—Improvements in the conversion of cast-iron into steel and malleable iron.
2219. Robert Mushet, Coleford, Gloucester—Improvements in the manufacture of iron and steel.
2220. Robert Mushet, Coleford, Gloucester—Improvements in the manufacture of iron and steel.
2221. William Bush Sellers and Abraham Sellers, Sheffield—An improvement in "ever-pointed" pencil cases.
2222. Joseph Wilson and Charles Wootton, Birmingham—A new or improved screw wrench. (A communication.)
2223. John Morrison, Birmingham—A new or improved penholder.
2224. Thomas Wallace, Limehouse—Improvements in the manufacture of wheels, axles, and axle boxes.

WEEKLY LIST OF PATENTS SEALED.

Sealed October 3*rd*, 1856.

814. Robert Halliwell.
816. Samuel Fisher.
846. William Henry Gauntlett.
878. Francisco Nuibo y Pedros.
982. John Yeomanson and William Yeomanson.
1002. William Edward Newton.
1632. Paul Prince.
1756. GeorgeTomlinsonBousfield.
1764. GeorgeTomlinsonBousfield.
1788. William Edward Newton.
1826. William Franklin Shaw.

Sealed October 7*th*, 1856.

848. Stephen Johnson Gold.
852. William Joseph Curtis.
856. Joseph Robert Whitgreave.
861. Henry Laxton.
868. Lewis Normandy.
886. Louis Pierre Coulon.
906. David Blair White.
927. Thomas Hollingworth.
935. Claude Moret.
949. Samuel Mellor and Thomas Young.
957. Alexander Symons and Edward Burgess.
958. Alexander Symons and Edward Burgess.
968. Rd. Archibald Brooman.
987. Victor Doat.
995. Isaac Daniel Fraétaniel.
1006. Thomas Heiffor.
1140. Alphonse Meillet.
1656. Alfred Vincent Newton.
1672. Alfred Vincent Newton.
1820. William Wood and Matthew Smith.
1821. William Wood and Matthew Smith.

PATENTS ON WHICH THE THIRD YEAR'S STAMP DUTY HAS BEEN PAID.

September 30*th*.

2248. Samuel Murland.

October 1*st*.

2251. Robert Halliwell and William Johnson.
2285. Manuel Fernandez de Castro.
2287. Henry Goddard.
2289. John Rubery.
2305. Joseph Denton.
2497. John Johnson.
2551. Thomas Irving.

October 3*rd*.

2261. Peter Rothwell Jackson.
2399. William Potts.
2316. George Fergusson Wilson.
2317. George Fergusson Wilson.
2318. George Fergusson Wilson.
2412. George Collier.
2414. Charles Barraclough.

October 4*th*.

2343. Edme Jules Maumené.
2385. Antoine Corvi.
2420. André Alexander Beaumont.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
3880	Sept. 26.	The Roller Action Pillar Pump	Thomas Frederick Hale.........	Bristol.
3881	„ 26.	Metallic Pen..	Joseph Gillott	Birmingham.
3882	„ 29.	Separating Cheese Vat	William Giles Speed	Shepton Mallet.